

REMARKS

In the Action, the Examiner repeated the restriction requirement discussed during a telephone conference on October 15, 2003; objected to the drawings; requested correction of the specification; rejected claims 1-2, 8-9, 32-33, and 35 under 35 U.S.C. § 102(b) as anticipated by Watanabe; and rejected claims 15-18 and 22 under 35 U.S.C. § 102(b) as anticipated by Quate.

The Examiner indicated that claims 3-7, 19-21, 23-31, and 34 would be allowable if rewritten in independent form. Applicant appreciates the early indication of allowable subject matter. Given the remarks below pertaining to the corresponding base claim(s) of these claims, Applicant, at this time, is not going to amend these claims to place them in condition for allowance.

A. Election Of Claims

Applicant hereby formally elects claims 1-9 and 15-35 and withdraws claims 10-14 from consideration. This affirms the election without traverse made by telephone on October 15, 2003.

B. Amendments To The Drawings And Specification

Applicant has amended Fig. 5 to include the reference numeral 124 as found in the specification at page 18, line 12 (not page 12, line 12 as cited by the Examiner). The amended drawing is attached hereto.

The Examiner also requested that Applicant either amend the drawings or the specification to provide appropriate reference to numerals 81, 82, and 84 appearing in Fig. 4B of the drawings, since those numerals do not appear in the specification. The Applicant has

amended the specification to include those numerals and therefore made no amendment to Fig. 4B.

The Applicant has also amended the specification to correct errors pointed out by the Examiner as well as errors discovered on review by Applicant's counsel. No new matter has been added. Entry of the amendments to the specification and drawings and withdrawal of the objections are respectfully requested.

C. Claim Rejections Based On Watanabe

The Examiner has rejected claims 1, 2, 8, 9, 32, 33, and 35 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,723,775 to *Watanabe et al.* (hereinafter "*Watanabe*"). However, the Applicant respectfully disagrees with the Examiner's interpretation of the *Watanabe* reference.

The Examiner has suggested that the vibrator 109 of the *Watanabe* patent acts as a compensation piece. However, contrary to the preferred embodiments, vibrator 109 has nothing to do with compensating for stress-induced deflection resulting from the manufacture of a compound microprobe. In atomic force microscopes ("AFMs"), a drive source, such as vibrator 109, may be used to drive the probe according to the mode of operation. For instance, one oft-used mode of operation is oscillating or intermittent mode, during which the tip of the probe is purposely caused to "tap" on the sample surface during operation. In this case, vibrator 109 is employed solely to cause the probe to oscillate. Vibrator 109 does not compensate for stress-induced deflection.

The stress-induced deflection (alternately referred to as "static bending" (p. 8, II.5-8)) referred to in the present application is unwanted deflection created in the process of fabricating

the microprobe, not the deflection purposefully created based on the mode of AFM operation. In this regard, as discussed in the Specification of the present application, surface stress on the microcantilever is often caused by the application of the various films and coatings that make up the compound microprobe. The first full paragraph on page 6 of the Specification discusses the use and fabrication of compound microcantilevers, while the following paragraph discusses the different types of coatings layered onto the surface of the microcantilever to improve or enable various features of the probe, selected based on the desired AFM application. The last paragraph of page 6, which continues on page 7, discusses one effect of coating the microcantilever with a film, i.e., the production of surface stress on the microcantilever. Finally, beginning at line 19 of page 7, the specification clarifies the problem associated with stress-induced deflection:

The problem of stress arises in the manufacturing of the multi-layer microcantilevers when the deflection due to stress is large enough to move the microcantilever outside the sensitive range of the deflection detection system.

Again, the compensation piece of the present invention is used only to compensate for this stress-induced deflection prior to AFM operation, and is not used to produce or control active deflection of the probe during AFM operation (e.g., caused by driving the probe into oscillation or by interaction between the probe tip and sample surface). Stress-induced deflection is also discussed in the Specification at page 13, lines 18-21 and page 15, lines 5-15.

In the end, *Watanabe* does not disclose compensating for stress-induced deflection using a compensation piece (“wedge”, for instance) or otherwise prior to AFM operation, it merely discloses a conventional feedback control loop for maintaining a set point associated with cantilever oscillation during operation. Claim 1 and its dependent claims 2, 8, and 9, are clearly directed to stress-induced deflection as that term is used in the present application. Claim 32 is

equally clear, as are dependent claims 33 and 35. The Applicant therefore respectfully requests reconsideration and withdrawal of the claim rejections based on the *Watanabe* reference.

E. Claim Rejections Based On Quate

The Examiner has rejected claims 15-18 and 22 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,517,280 to *Quate* (hereinafter "*Quate*"). The Applicant also respectfully disagrees with the Examiner's interpretation of the *Quate* reference.

The Examiner has suggested that capacitive plates 26 and 99 of the *Quate* disclosure act as a first microprobe compensation piece as claimed in the present invention. To the contrary, the capacitive plates of the *Quate* photolithography system have nothing to do with mounting the probe using a compensation piece to overcome the static deflection problem associated with fabricating compound microprobes. The plates 26, 99 are used to cause vibration of the tip and otherwise control tip movement during operation. The deflection being compensated for in the present invention, as discussed above, is a static deflection of the microcantilever caused by fabricating a compound microprobe. Again, this deflection is compensated for by a unique mounting arrangement employing a fixed compensation piece, e.g., a wedge. By mounting the probe using a wedge, the probe can be properly aligned within the operating range of the deflection detection scheme.

Claim 15 is clearly directed to compensating for static deflection. Claims 16 – 18 and 22, each of which are dependent, either directly or indirectly, on claim 15, are likewise directed to compensating for static deflection. *Quate* does not disclose compensating for this type of deflection, but only techniques, such as frequency modulation, that control probe deflection during use of an AFM, in this case, in a lithography application.

Overall, the capacitive plates discussed in *Quate* do not address the problem of static deflection and therefore *Quate* does not anticipate any claim of the present application. The Applicant therefore respectfully requests reconsideration and withdrawal of the claim rejections based on the *Quate* reference.

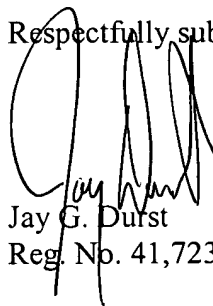
CONCLUSION

In light of the foregoing, the Applicant believes that the application has been put into proper form and that each of pending claims 1-9 and 15-35 is allowable. The Applicant respectfully requests such action, and invites the Examiner to contact the undersigned at the telephone number appearing below if any questions remain.

Applicant respectfully requests an extension of time of one-month under 37 CFR 1.136(a). A check in the amount of **\$110.00** is enclosed for the fee due in connection with this extension and is believed to be sufficient under 37 CFR 1.17(a)(1).

The Director is authorized to direct any additional fees associated with this or any other communication, or credit any overpayment, to Deposit Account 50-1170.

Respectfully submitted,



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